[0022] In the rotation control operation, at the same time as the vehicle is rotated, the steering wheel may be rotated according to the rotation angle of the vehicle in the direction opposite to the rotation direction of the vehicle, and when the rotation of the vehicle is terminated, the steering wheel may be restored and rotated by as much as the angle at which the vehicle is rotated in the direction opposite to the rotation direction of the vehicle to allow a termination point of time of an in-situ rotation to be recognized.

[0023] In the rotation control operation, when the vehicle is rotated in-situ, the steering wheel may be rotated in a direction opposite to a rotation direction of the vehicle by as much as an angle at which a driver steers the steering wheel.

[0024] In the rotation control operation, at the same time as the vehicle is rotated, for the in-situ rotation of the vehicle, the steering wheel may be rotated in the direction opposite to the rotation direction of the vehicle according to the steering angle of the steering wheel steered by the driver, and when the rotation of the vehicle is terminated, the steering wheel may be restored and rotated by as much as the angle at which a driver steers the steering wheel in the direction opposite to the rotation direction of the vehicle to allow a termination point of time of an in-situ rotation to be recognized.

[0025] In the rotation control operation, during an in-situ rotation of the vehicle, when the steering wheel is additionally steered in a rotation direction of the vehicle, the vehicle may further be rotated by as much as an additional steering angle of the steering wheel.

[0026] In the rotation control operation, a rotation angle of the vehicle may be guided through a notification part.

[0027] The notification part may display the rotation angle of the vehicle on a cluster or guide the rotation angle of the vehicle through voice.

[0028] The notification part may temporarily provide a different operation feeling to the steering wheel at every predetermined rotation angle during the in-situ rotation of the vehicle.

[0029] In the rotation control operation, a rotation speed of the vehicle may be determined according to a step-in amount of the accelerator pedal to rotate the vehicle.

[0030] In the rotation control operation, rotational acceleration may be gradually increased within a range of a step-in amount of the accelerator pedal at an initial stage of the rotation of the vehicle.

[0031] In the rotation control operation, the rotational acceleration may be gradually decreased before the target rotation angle is reached at an end stage of the rotation of the vehicle.

[0032] In the rotation control operation, when the brake pedal is stepped in while the vehicle is rotated, a rotation speed of the vehicle may be reduced.

[0033] According to another embodiment, there is provided a system for controlling an in-situ rotation mode of a four-wheel independent steering type vehicle, which includes a controller configured to steer and rotate a steering wheel when an in-situ rotation mode of a vehicle is executed, calculate a target rotation angle of the vehicle on the basis of a steering angle of the steering wheel when the steering wheel is steered, and control the vehicle to be rotated in-situ by as much as the target rotation angle when a step-in signal of an accelerator pedal is applied.

BRIEF DESCRIPTION OF THE DRAWINGS

[0034] The above and other objects, features and other advantages of the present disclosure will be more clearly understood from the following detailed description when taken in conjunction with the accompanying drawings, in which:

[0035] FIGS. **1**A to **1**F are diagrams for describing a steering rotation of a wheel and a vehicle behavior for each driving mode of a four-wheel independent steering type vehicle;

[0036] FIG. **2** is a block diagram illustrating a control system of a four-wheel independent steering type vehicle according to embodiments of the present disclosure;

[0037] FIG. **3** is a diagram for describing an operation in which an in-situ rotation of a vehicle is divided and set in units of 30° and rotated according to embodiments of the present disclosure;

[0038] FIG. **4** is a diagram for describing an operation in which an in-situ rotation of the vehicle is divided and set in units of 45° and rotated according to embodiments of the present disclosure;

[0039] FIGS. **5** and **6** are schematic exemplary diagrams illustrating a mode switching mechanism applied to the four-wheel independent steering type vehicle according to embodiments of the present disclosure;

[0040] FIG. **7** is a step-by-step diagram illustrating rotation behaviors of a steering wheel and a vehicle during an in-situ rotation process of a vehicle according to embodiments of the present disclosure;

[0041] FIG. **8** is a diagram for describing an operation of warning an in-situ rotation angle through an operation feeling change in embodiments of the present disclosure; and

[0042] FIG. **9** is a flowchart illustrating an overall process of controlling an in-situ rotation mode of the four-wheel independent steering type vehicle according to embodiments of the present disclosure.

DETAILED DESCRIPTION OF ILLUSTRATIVE EMBODIMENTS

[0043] Exemplary embodiments of the present disclosure will be described in detail below with reference to the accompanying drawings.

[0044] FIG. **2** is a block diagram illustrating a control system of a driving mode switching of a four-wheel independent steering type vehicle according to embodiments of the present disclosure.

[0045] Referring to the drawing, a four-wheel steering system which is applicable to the present disclosure includes a driving mode switching mechanism **10**, a steering wheel **20**, an accelerator pedal **30**, a brake pedal **40**, a controller **50** (electronic control unit or (ECU), corner modules **60***a*, **60***b*, **60***c*, and **60***d* for performing independent steering in wheels, and a driving part **70**.

[0046] Specifically, the driving mode switching mechanism **10** may be implemented through a gear shift lever which is operated to be moved within a gear shift gate as shown in FIG. **5** or implemented through gear shift buttons as shown in FIG. **6**.

[0047] For example, in the case of a gear shift lever type mechanism of FIG. **5**, a gear shift gate is formed along a movement path of the gear shift lever, and a general driving mode including a P-stage (parking stage) mode **11**, a D-stage